Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 151, 1 (2018)	1-Apr-2018

Q(β^-)=1.521×10^4 *SY*; S(n)=3.5×10^3 *SY*; S(p)=1.567×10^4 *SY*; Q(α)=−1.34×10^4 *SY* 2017Wa10
ΔQ(β^-)=550, ΔS(n)=565, ΔS(p)=640, ΔQ(α)=800 (2017Wa10).

2009Ta05,2009Ta24: ^{59}Sc identified by fragmentation of ^{76}Ge beam at 132 MeV/nucleon at NSCL facility using A1900 fragment separator combined with S800 analysis beam line to form a two stage separator system. The transmitted fragments were analyzed event-by-event in momentum and particle identification. The nuclei of interest were stopped in eight Si diodes which provided measurement of energy loss, nuclear charge and total kinetic energy. The time-of-flight of each particle that reached the detector stack was measured in four different ways using plastic scintillators, Si detectors, and parallel-plate avalanche counters. The simultaneous measurement of ΔE signals, the magnetic rigidity, total kinetic energy and the time-of-flight (TOF) provided unambiguous identification of the atomic number, charge state and mass number.

Theoretical calculations: 1995Ri05 (binding energy, mass defect).

^{59}Sc Levels

E(level)	Comments
0.0	%β^-=100; %β^-n=? Measured cross section=9×10^{10} mb *+1−2* (estimated from figure 2 of 2009Ta05). E(level): Fragment observed by 2009Ta05 is assumed to be in the ground state of ^{59}Sc. J$^\pi$: 7/2$^-$ (syst,2012Au07), 7/2$^-$ (predicted,1997Mo25). T$_{1/2}$: Lower limit can be estimated from time-of-flight of ≈360 ns as in 2005St29 (from the same lab as 2009Ta05). Actual half-life is expected to be much longer as suggested by systematics value of 10 ms (>620 ns) (2012Au07) and calculated value of 7.1 ms (1997Mo25). Calculated (1997Mo25) populations of daughter nuclides: 51% for ^{59}Ti, 47% for ^{58}Ti through β^-n decay and 1.5% for ^{57}Ti through β^-2n decay.